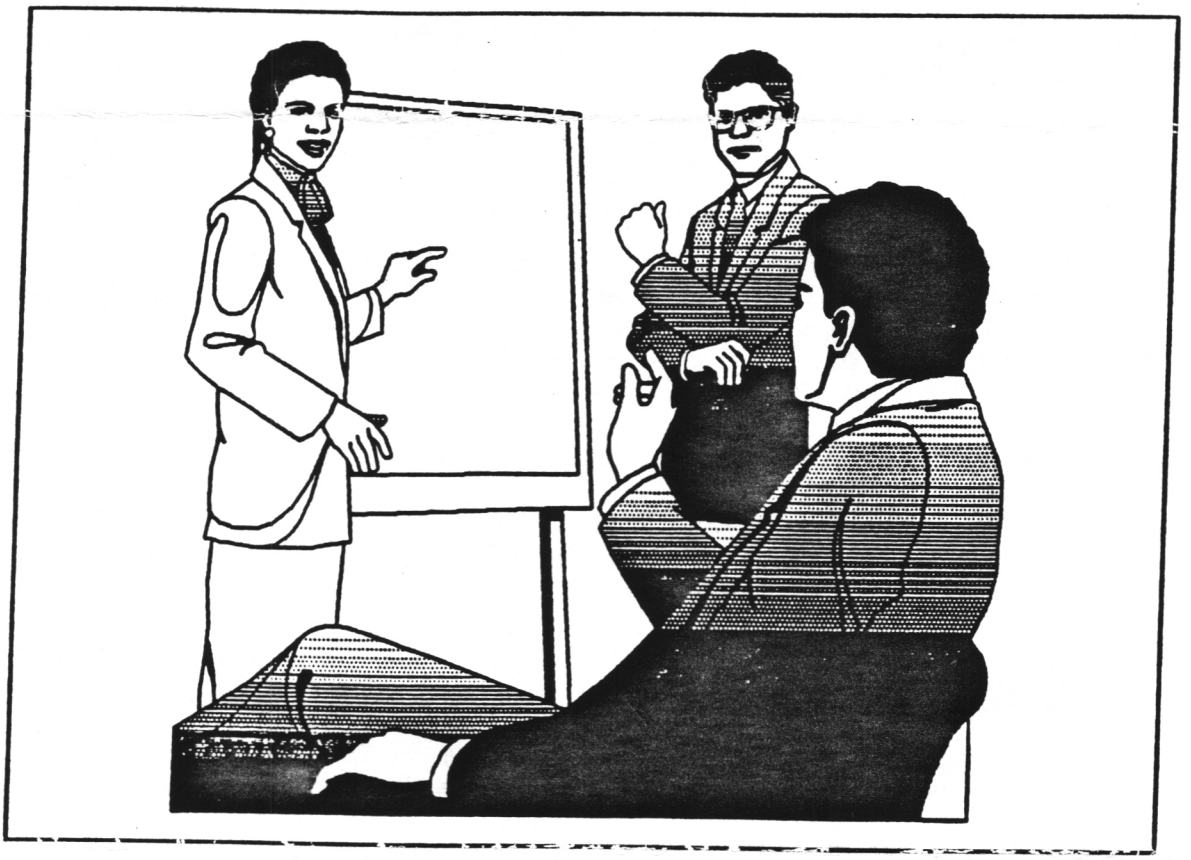
Issue: JANUARY 1997

LISTing Policy ..... Annual Dues $ 16.00

LISTings

Newsletter of the Long Island Sinclair / Timex Users' Group

NEXT LIST MEETING February 9th, 1997



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QL CORNER

The October/November issue of the NESQLUG News stated that Bill Cable provided some information for the next QL Show in the USA. It is now firm that the QL Show will be held in Bedford, PA, on May 3rd. No motel has been selected, however, this allows those who wish to attend to make travel plans. As agreed in the last NESQLUG meeting, it will be sponsored by NESQLUG and Bill Cable and Ed Kingsley are the contact people. Stuart, Jochen and the Buders are coming from Europe and possibly Albin. Frank Davis will be coming to Bedford. Those travelers who will not drive to Bedford, PA, should book airline reservations into Dulles Airport, Washington, DC. More details will follow.

Last month I had written lots of technical information about Eproms and Eprom Erasers. I telephoned several large lighting companies on Long Island about purchasing the G8T5 bulb or (Germicidal lamp). The price now is in the $50.00 plus range, so I decided to purchase a commerical Eprom Eraser, the DATArase II from DC electronics. The price is $39.95 and this eraser will erase most eproms in approximately 3 minutes. The short erase time is due to placing the lamp close to the eprom windows.

A test of erasure times for 27256 eproms was established and all eproms erased within 3 1/2 minutes. My original Eprom eraser took approximately 25 minutes to erase a 27256 eprom. The original Eprom eraser could only erase two eproms at a time, however, the DATArase II will erase four eproms at one time. The manufacturer of the DATArase II is: Walling Co., Tempe, AZ 85282, telephone 1-800-338-9813. The DATArase IIACT has an internal timer and a beeper. The cost is $49.00.

I have found only one book dedicated to Eproms, Eprom programmers and Eprom erasers. 'Experimenting With Eproms', by author Dave Prochnow, 240 pages, soft cover. Within the pages are schematics for programming Eproms, Eprom erases and 15 different Eprom projects. You can order this book from Electronics Engineers Book Club, Blue Ridge Summit, PA 17294-0860.

I would like to thank our members of LIST for calling about last months QL Corner article on Eproms. Thanks for your support!

News from QUANTA, December 1996

Ultra Gold Card alias Goldfire

QL designer Zelkjo Nastasic was contacted by Graham Underwood for details on the Ultra Gold Card for the QL. The UGC will plug into an existing original QL. Apparently, the original QL power supply for the QL is the biggest problem right now.

The 8 bit bus is arranged exactly as on the QL/GC/SGC, with a few extensions and has the ability to operate faster with 8-bit peripherals. The 32 bus is multiplexed (address/data) and uses the same physical connector in a transparent manner, meaning you can mix 8 and 32 bit peripherals on the same backplane (Qplane, for instance) without them ever interfering with each other. 32 bit peripherals do not occupy the same address space as the 8-bit ones (i.e. they have their own, very large IO area).

Comparison of the data transfer speeds: Standard 8-bit bus (GC/SCG) = 1.8 Mbytes/s. Fats bit (UGC + Aurora) = around 5 Mbytes/s. 32 bit (future UGC peripherals) = 20 Mbytes's.

More design goals for the UGC:
- Approximate size: 160x100mm (like the Aurora)
- Motorola MCF 5102 "Coldfire" CPU, at 25 (or quite possibly 33 MHz but it is not available yet, except as samples)
- 32 bit, 72-pin SIMM memory, as used in the PC. Maximum size will probably be 64 or 256 Mbytes. A single SIMM can be used (the reason is the power supply, it uses most of the power on the board), of any type (single/double-sided, standard/EDO.
- Full bidirectional parallel port, connector compatible with PC/SGC.
- New bus protocol, fast 8-bit and 32-bit.
- Memory shadowing/transparent writing for Aurora (with fast protocol should achieve 3x speed compared to SGC). Other things are being considered, like I2C interface, universal power supply (5 - 10V input, no jumpers), background floppy access, passive mode for multiprocessing (multiple UGCs on bus), and similar. Whether we manage to integrate them at a reasonable cost remains to be seen. Of course, established GC/SGC features (TK2, floppy interface) will be implemented on the UGC as well.

Through 1973 - 1986, I was lucky enough to fly to London and Dublin conducting seminars for British Airways and Aer Lingus. During my off hours, I would hop a bus to the local book shops (Book sellers). Most of these book shops had a table in the center of their shops. In amazement, I would watch young people (ages 4 - 10) sitting on a pile of books and operating computers such as the ZX 81, Spectrum and a host of other computers. I recently came across an article in the local 'Penny Saver' type publication, The Shopper's Guide, Massapequa and Massapequa Park edition. This article reminded me of these youngsters.

Dr. Toy by Stevanne Auerbach, Ph.D.

Software can be used to help children to learn new skills, like the alphabet, typing, math, grammar, spelling, etc. It can be a lot of fun for the child and a good way to reinforce what's already been learned. Skills can be strengthened when the child plays with appropriate games and practices what's being learned. Select some of these software programs to help your child gain confidence in their abilities. Let us also know what works for your child.

Sunburst A to Z (ages 3-6 yrs.) $34.95, 1-800-786-3155. An excellent product with 26 different activities, one for each letter of the alphabet. There are animation and musical aspects to assist the child. Learning letters, numbers, shapes, and colors is fun with this well produced item. In addition, the child gains understanding of opposites, matching and memory .

Sunburst Type to Learn (ages 8-14 yrs.) $34.95, 1-800-786-3155. This is a very important skill for children to learn. The program makes learning to type easier. There are 22 step-by-step lessons to help students gain skills in spelling, grammar and other areas, such as composition and punctuation. Also, the child will gain useful facts about geography and astronomy. Six games are included. This classroom-tested program has proven its value and it's the perfect summertime activity.

Knowledge Adventures Jump Start Preschool (ages 2-4 yrs.) $35.00, 1-800-542-4240. For the child ready to move ahead to prepare for the year ahead, this program will introduce the child to a lot of the skills needed. There are three levels of difficulty of reading, memory skills, numbers and auditory discrimination. The use of bright colors, sounds and animation adds to the enjoyment. There are animal friends to make learning even more fun and 10 songs are included.

Stevanne Auerbach, Ph.D., author , consultant and expert on child development and children's products, is the Director of the Institute for Childhood Resources. She selects "The 100 Guide, a new magazine on the Internet's World Wide Web, at http://www.drtoy.com. Send your comments or questions via e-mail to: drtoy drtoy.com or write: Dr. Toy, 220 Montgomery St. #2811, San Francisco, CA 94104 (for a complete list, send a self-addressed, stamped No. 10 envelope.

The above programs are for IBM compatible computers. A thought..... Couldn't we produce programs such as these childrens programs outlined in this article? We have some pretty good QL and TS268 programmers - How about it!

See you next month... *Bob Gilder*

ZX Burglar Alarm

Feeling insecure? Try this neat burglar alarm interface for your ZX81.

By D.C. McMahon

THIS MICROPROCESSOR controlled security system will monitor up to eight remote switch positions each of which can be either normally open or normally closed, allowing you to use any combination of pressure mats, magnetic catches, window foil or other devices as the sensors. When triggered, it immediately sounds an alarm and then displays the number of the affected input on a seven-segment LED. It can be used with the ZX81 and quite aside from its value as an intruder alarm it provides a useful introduction to the techniques of microprocessor interfacing using machine code and the Z80 Parallel Input/Output Controller.

The Z80 PIO consists of two groups of eight lines, port A and port B, and each line can act as either a data input or output. If the IN instruction is used, the data on those lines defined as inputs is loaded into the accumulator. If the OUT instruction is used, data on the accumulator is latched onto the output lines. The PIO can be programmed to act in any one of four modes:

Mode 0 — Output mode
Mode 1 — Input mode
Mode 2 — Bidirectional mode
Mode 3 — Control mode

The first three modes require the use of the handshaking facilities and so for this design the much simpler control mode has been used, allowing easy input and output of data to and from both eight bit ports on the PIO. Port A provides the eight inputs from the sensing switches while port B is split into four inputs and four outputs, the inputs being used to enter data while the outputs feed the seven segment display. An eight bit word is entered via port B into the register which tells the microcomputer which of the input lines should be high and which low (corresponding to normally open and normally closed switches respectively). The contents of this register are then continuously compared with the inputs to port A and if any discrepancy is discovered a '9' is sent out to the display. A timing loop, formed by loading a high number into the registers H, L, and then successively subtracting one until the result is zero, ensures that the nine is displayed for at least a second or so, after which the number of the affected input is displayed. An AND gate monitors the A and D data lines into the display driver and thus goes high when the 9 is output, the delay ensuring that it remains high long enough to latch the relay and thus sound the alarm.

Construction

Most of the components, including the relay and the transformer, are mounted on the PCB, the only off board components beings the switches, the LED display, the edge connector to suit the ZX81, and the siren or other output transducer. Make sure that all four ICs are inserted the right way around, and similarly check the electrolytic capacitors C1, C4, and C7, and the diodes. Provision has been made for the use of connectors for the LED display and the input lines but if you prefer you can, of course, solder

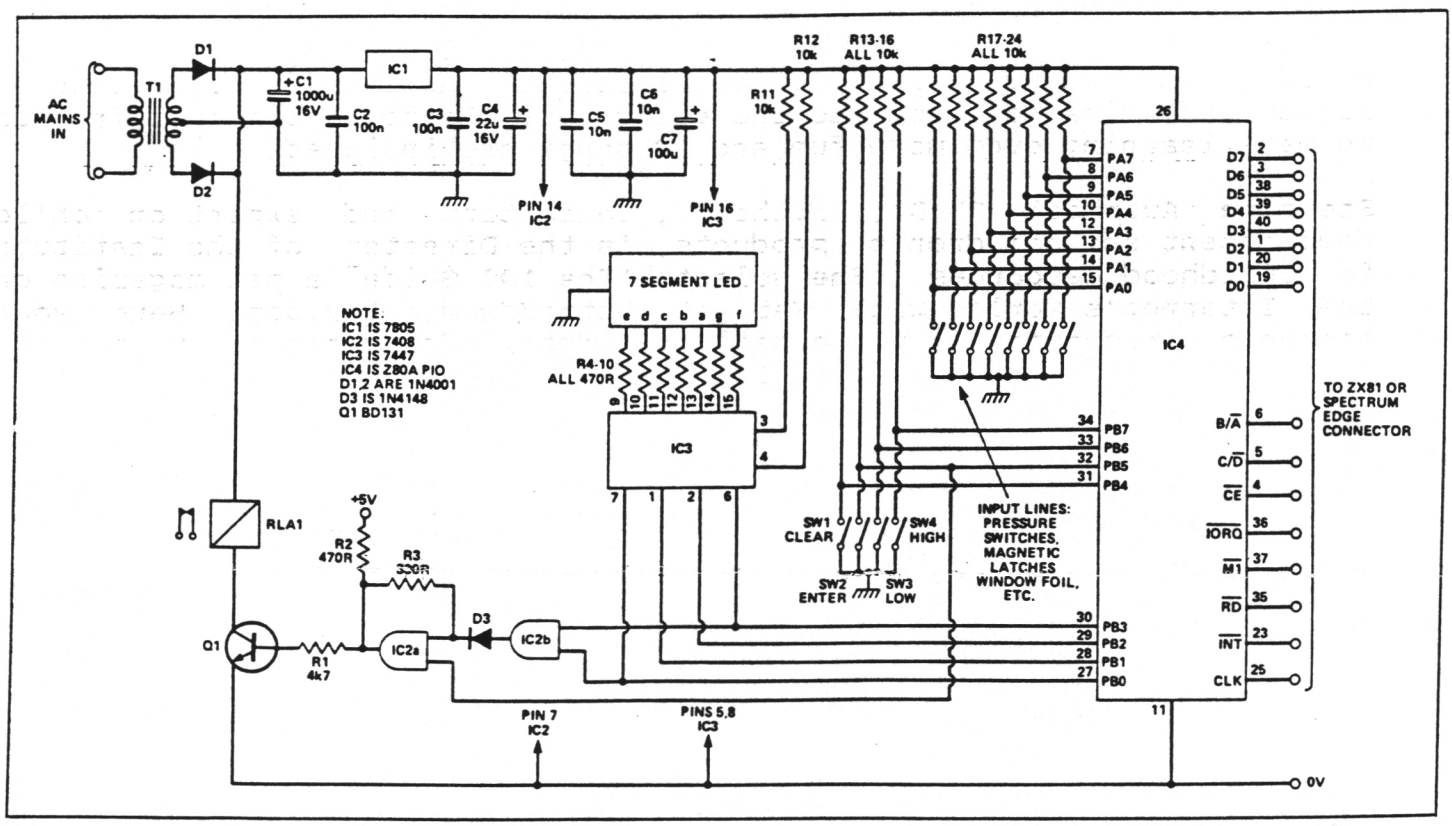


Fig. 1 Circuit diagram of the burglar alarm.

directly to the board. It is intended that the relay should switch a siren or similar device which draws its power from an external source, e.g. the mains, but if your particular application does not specifically demand an eardrum piercing, complaint eliciting siren, you might prefer to use an audible warning device of some sort instead. Providing this does not draw more than 100 mA or so and will run from 17V or less, you can connect it directly in the collector circuit of Q1 and dispense with the relay entirely. The edge connector for the ZX81 should be wired in accordance with Fig. 2.

The choice of case is left entirely to the constructor, but since there is mains on the board it is advisable to have some sort of enclosure. Mounting the switches should present no problems but the LED display is not so easy. If you're after a particularly neat appearance you would perhaps do best to go for an easily cut plastic case, and to cut out an aperture for the LED and then mount it flush in epoxy. The input lines, mains input, and connections to the microcomputer could either be taken through grommets or, if you're really fussy, through appropriate connectors, although it is probably most convenient to use a connector only for the input lines.

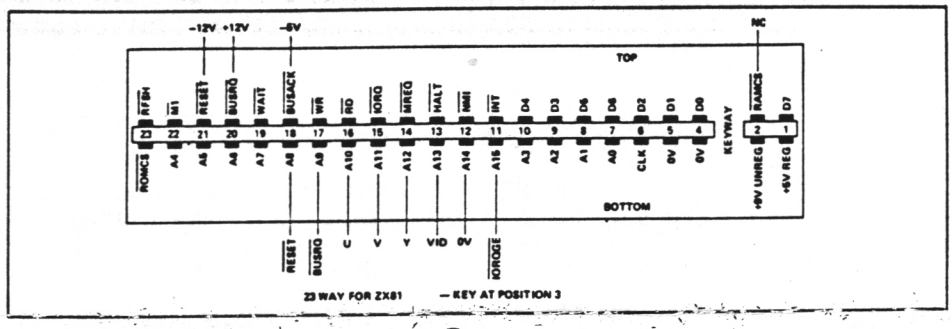


Fig. 2 Pin connections of the ZX81 expansion port

A7	A6	A5	A4	A3	A2	A1	A0	PORT
0	0	0	1	1	1	1	1	A data
0	1	0	1	1	1	1	1	A control
0	0	1	1	1	1	1	1	B data
0	1	1	1	1	1	1	1	B control

Table 1 Examples of eight bit PIO address words.

BIT	7	6	5	4	3	2	1	0
output mode	0	0	1	1	1	1	1	1
input mode	0	1						
bidirectional	1	0						
control	1	1						

Table 2 Format of the operation control word.

Programming

The Z80 PIO has six control lines, three of which (MI, IORQ, and RD) can be connected directly to their counterparts on the ZX81 edge connector. The remaining three, B/A SEL (select port A or B), C/D SEL (select either control or data carried on bus), and CE (chip enable) must be connected to the address bus. The ZX81 address bus has the following characteristics: A0, A1, A2, A3, and A4 are all normally high (they are used to control printer, loudspeaker, etc.), so we can leave these high and connect B/A SEL, C/D SEL, and CE to the remaining three lines, A5, A6, and A7 respectively. A5 low selects port A, A5 high selects port B; A6 low selects data (input and output) and A6 high selects control (programming information). A7, the chip enable, is always held low. The resulting eight bit words are shown in Table 1 and their decimal values are 31, 93, 63, and 127 respectively.

We must next initialize the PIO by sending two control words to each port. The first defines which mode and, as we are using mode three, a second must be sent to define which of the eight lines are inputs and which outputs. The format of the operation control word is shown in Table 2, and it will be seen that the relevant control word for ports A and B is 11111111, that is, decimal 255.

The second control word also consists of eight bits, each one corresponding to the I/O line with the same number, i.e., bit 0 corresponds to PA (or PB) 0, bit 1 corresponds to PA1, etc. Setting the bit high defines the associated I/O line as an input, while setting it low defines it as an output. Since port A consists of the eight input lines from the various sensing switches, its control word will be 111111111, again, decimal 255. Port B has lines 0, 1, 2, 3 outputting data to the LED display and lines 4, 5, 6, and 7 accepting input data from the push button switches, so its control word will be 11110000, that is, decimal 240.

The first six instructions of the program therefore consist of loading the relevant control word into the accumulator and outputting it to either address 93 or address 127 (see Table 4 and the flow chart, Fig. 3).

Before the progam can be entered, you will need to reserve space for the 108 bytes of machine code by moving RAM-TOP. To do this type in:

```
POKE 16388,147
POKE 16389,67
NEW
```

and follow each statement with the Newline command. To check that RAMTOP has been moved, type in:

```
PRINT    256*PEEK 16389 + PEEK
         16388
```

and you should get 17299.

Having reserved the 108 bytes after RAMTOP in the ZX81, type in:

```
10 FOR N=0 to 107
20 INPUT X
30 POKE 17299+N,X
40 NEXT N
50 PRINT USR 17299
```

then RUN. The computer will then wait for you to type in the 108 numbers given in Table 3.

When the programming has been completed, a 1 should appear on the LED

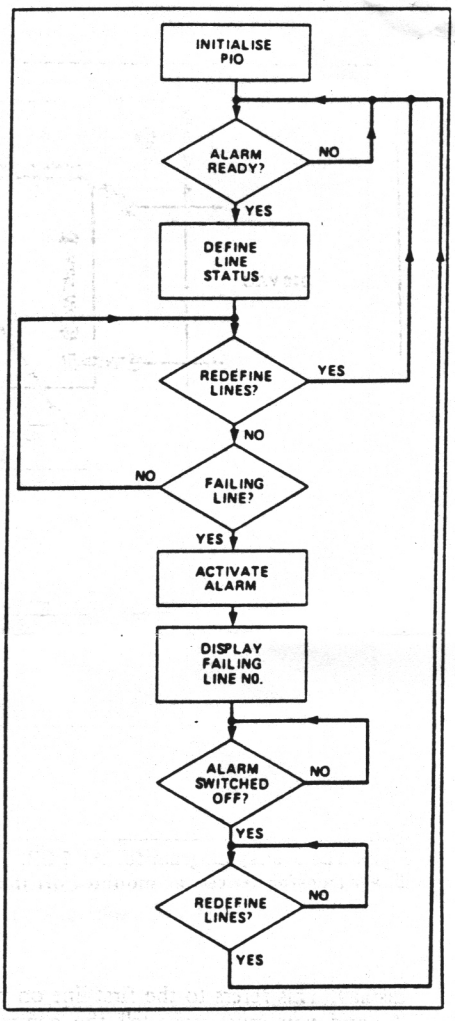
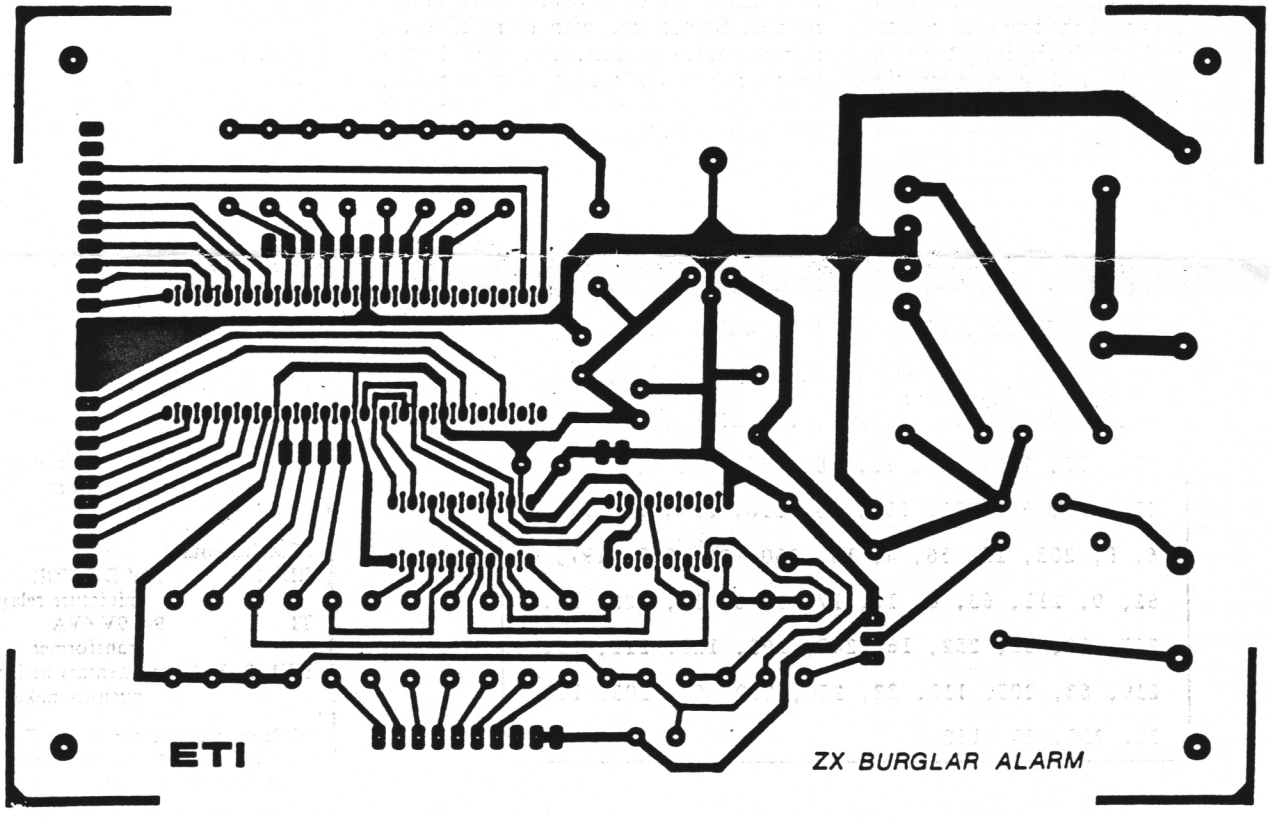


Fig. 3 Flow chart of the burglar alarm program.



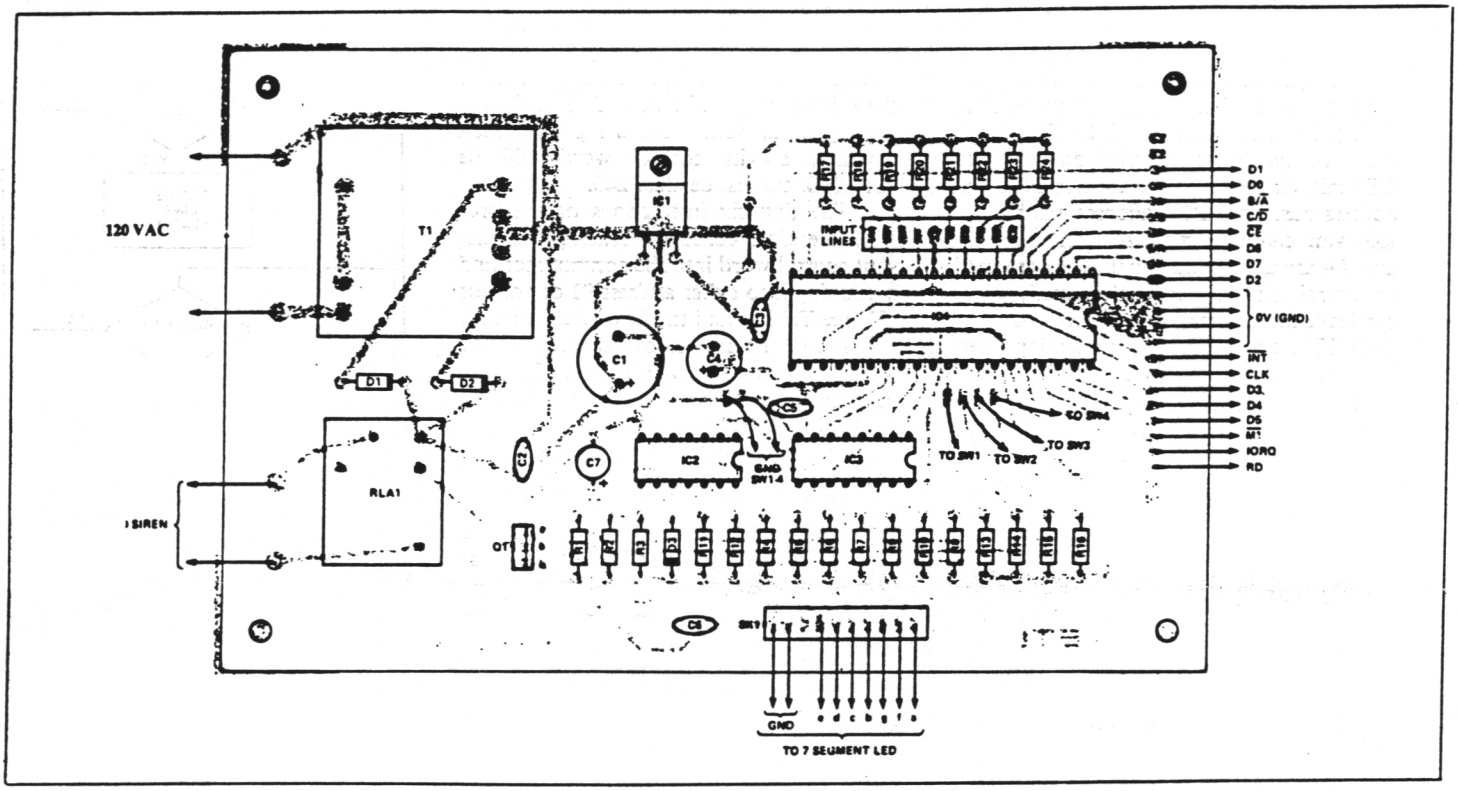


Fig. 4 The overlay diagram for the PCB. Note: the circuit was originally designed for a PC-mounting transformer which may not be available. An ordinary transformer can be mounted off the board with the leads soldered to the PC pads.

display. This refers to the first line on port A, and you must now tell the computer whether this line is to be high or low, according to what type of sensing switch you plan to use on it. To do this you first press either switch SW3 (LOW) if the line is to be normally closed or SW4 (HIGH) if the line is to be normally open, and then press the ENTER switch SW2. The LED should now display a 2, and you repeat the procedure with this and each of the subsequent lines.

When all eight lines have been entered and the register is full, the microprocessor goes into a continuous loop, checking each line against its corresponding bit in the register. Should you wish to redefine the normal state of the lines, pressing SW1 empties the register and thus stops the program. If the alarm is triggered, it can be reset by pressing first SW2 and then SW1.

```
62, 255, 211, 93, 211, 93, 211, 127, 62, 240,
211, 127, 219, 63, 203, 111, 40, 250, 6, 8,
62, 0, 30, 0, 60, 211, 63, 219, 63, 203, 119,
40, 5, 203, 127, 32, 246, 28, 219, 63, 203,
111, 32, 250, 203, 11, 16, 232, 62, 0, 211,
63, 219, 63, 203, 103, 40, 210, 219, 31, 171,
6, 8, 203, 23, 56, 4, 16, 250, 24, 237, 197,
62, 9, 211, 63, 6, 10, 17, 1, 0, 33, 222, 57,
237, 82, 32, 252, 16, 247, 193, 120, 211, 63,
219, 63, 203, 111, 32, 250, 219, 63, 203, 103,
32, 250, 24, 160
```

Table 3 The ZX81 data.

PARTS LIST

Resistors (all ¼ W, 5%)

R1	4k7
R2, 4,5,6, 7,8,9,10	470R
R3	330R
R11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24	10k

Capacitors

C1	1000u 16V electrolytic
C2, 3	100n
C4	22u 16V electrolytic
C5, 6	10n ceramic
C7	100u 10V tantalum

Semiconductors

IC1	7805
IC2	7408
IC3	7447
IC4	Z80A PIO
Q1	BD131
D1, 2	1N4001
D3	1N4148
DISP1	Common anode 7-segment display

Miscellaneous

RLA1	12V DC 400R miniature relay
T1	9-0 9V 6VA transformer
SW1, 2, 3, 4	momentary action, push-to-make

PCB: edge connector to suit ZX81; 10-way 0.1" pitch PCB plug and socket — 2 off each; case, etc. to suit.

```
LD  A     255          62,   255
out A      93          211,   93
out A      93          211,   93
out A     127          211,   127
LD  A     240          62,   240
out A     127          211,   127
IN         63          219,   63
BIT 5                  203,   111
JRZ        -6           40,   -6
LD  B       8           6,    8
LD  A       0           62,   0
LD  E       0           30,   0
INC A                   60,
out A                   211,   63
IN         63           219,   63
BIT 6                   203,   119
JRZ         5           40,    5
BIT 7                   203,   127
JRNZ      -10           32,   -10
INC E                   28,
IN         63           219,   63
BIT 5A                  203,   111
JRNZ       -6           32,   -6
RRE                     203,   111
DJNZ      -24           16,   -24
LD  A       0           62,   0
out        63           211,   63
IN         63           219,   63
BIT                     203,   103
JRZ       -46           40,   -46
IN         31           219,   31
XOR E                   171,
LD  B       8           6,    8
RLA                     203,   23
C                       56,    4
DJNZ                    16,   -6
JR        -19           24,   -19
PUSH B                  197
LD  A       9           62,   9
out        63           211,   63
LD  B      10           6,    10
LD  DE      1           17,   1,     0
LD  HL  14814           33,   222,   57
SBC HL, DE              237,   82
JRNZ       -4           32,   -4
DJNZ       -9           16,   -9
POP B                   193
LD A, B                 120
out 63                  211,   63
IN  63                  219,   63
BIT 5                   203,   111
JR NZ      -6           32,   -6
IN  63                  219,   63
BIT 4                   203,   103
JRNZ       -6           32,   -6
JR        -96           24,   -96
```

Table 4 Assembler listing of the burglar alarm program.

HOW IT WORKS

The various intruder detecting switches are connected between ground and the eight lines of port A on the PIO. Each of the eight lines is connected to the +5V line through a pull-up resistor, so that when the associated switch is open a logic high level will appear on the input, and when the switch is closed the line will be pulled down to logical low. The latter four lines on port B are similarly connected so that pushing any of switches 1 to 4 takes the associated line low. The first four lines on port B are used for the display output and carry a four bit binary code. This is fed directly to the decoder/driver 7447 and then to the seven segment display.

When the program is executed it puts out a '1' and then waits for the line to be defined. Taking either line 6 or line 7 on port B low enters a 0 to 1 as desired into register E. Subsequently taking line 5 low initiates a rotate right instruction which moves the entered data one place to the right so that the register is ready to receive the next bit. The microprocessor then outputs a '2' and the process is repeated until register E is full.

The microprocessor then goes into a continuous loop, using the XOR function to simultaneously compare each input line with the corresponding bit in register E. If both bits are at the same level, either both high or both low, the XOR function will produce a 0 output, but if the two bits are at different logic levels the XOR will give a 1. The RLA instruction is used to shift each bit into the carry flag and test for a 1 and if no carry is detected the microprocessor carries on testing the lines.

When a 1 is detected, a nine is briefly sent out via port B to the display. At the same time, a large number is loaded into registers H and L and 1 is successively subtracted until the result is zero. A total of 148 140 machine cycles are needed for this, and the nine is therefore displayed for a full second or so before the micro processor removes it and displays instead the number of the failed line. The AND gate IC2b has its inputs connected to the A and D lines from port B, and will therefore go high only when a nine is put out. Its output is connected to IC2a, another AND gate, which is wired as a latch. IC2a drives the transistor Q1 which turns on the relay. The other input of IC2a is connected to line 5 of port B, and if SW2 is pressed this line will go low, unlatching the gate and thus turning off the relay.

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Please send all inquiries and submissions (including dues) to:

L.I.S.T.
Mr. Harvey Rait
5 Peri Lane,
Valley Stream, N. Y. 11581

COMING EVENTS: The next L.I.S.T. meeting will be Sunday 2/Ø9/'97 at 2 P.M. at the home of Harvey Rait (see address above).

"QL TODAY", NEW MAGAZINE by Timothy Swenson

[QL lives! It seems that soonest a one QL publication folds, a new one springs up. This notice about QL Today was issued in May 1996 and is spot-edited. Swenson, of the US Air Force Institute of TEchnology, is at SWENSOTC@SD2.WPAFB.AF.MIL.]

The QL magazine IQLR has recently stopped publishing, mostly due to the editors failing health. A number of European QL vendors (Jochem Merz, Tony Firshman, and Dylwin Jones) have created "QL Today" to take over for IQLR readers.

At the North American QL show, I picked up a copy of the first issue. It looks pretty good and I did subscribe.

Other QLers might be interested in knowing that "QL Today" does exist. The bad thing for North American QLers is that the cost of subscribing will be higher than IQLR was, due to the high cost of mailing. This was the same problem European QLers had with IQLR.

The Subscription costs are:

Germany	DM 70 or 30 pounds
England	DM 60 or 25 pounds
Other	DM 79 or 30 pounds

For US QLers that's about $45. A bit steep, but with the soom demize of UPDATE, "QL Today" will be THE primary place to get QL information.

For more information contact Tony Firshman, TONY@FIRSHMAN.DEMON.CO.UK.

Taking a P.C. To the Toilet

Jackie Mason

Suffice it to say that Jackie Mason is not so crazy about the new technology. This is excerpted from the comedian's one-man show on Broadway, "Love Thy Neighbor":

They tell you, "Oh, you have a computer — you can talk to people all over the world." People buy it. They buy it because of the publicity that you can talk to people all over the world. You can have 3,000 newspapers. You can have everything....

"Oh, I got a computer!"

"What do you do with it?"

"I don't know."...

Imagine if the opposite was true. Imagine if everybody had a computer for $9,000 and you were stuck by a table every time you had to learn anything or read anything... And all of a sudden somebody invented a whole new thing — a newspaper! You know what would happen? Everybody would say, "What an invention! A newspaper! For half a dollar you got the same thing!" Not only that, you can take it wherever you want to go. You can't take a computer to the toilet.... You can take this wherever you want — wherever you want! The dog: he's about to go — do you put a computer underneath?

All the geniuses with computers love to tell you you can talk to people all over the world if you're on line. Who wants to? You want to talk to people all over the world? People don't talk to the guy next door.... People are standing in an elevator — do you talk to anybody? A guy calls you up and he's got the wrong number — do you start a conversation? Do you ever say, "Sure glad you got the wrong number!" You're gonna holler, "You got the wrong number!" And God forbid he calls you again: you think he's a stalker, you call the police.

People are nuts, you know that?... They're crazy about computers.... Last week a guy calls me: "I spoke to a guy from Siberia, a mountain climber from Siberia."... If a mountain climber from Siberia came over to your house and said, "Hello, I'm a mountain climber!" Would you say, "Come in, I'm dying to talk to you! All my life I wanted to talk to a mountain climber from Siberia! It's my greatest dream!"

It's the biggest fraud in the world. They also like to tell you you can make airline reservations all over the world. You ever see these nuts with the computers? "All over the world I can make airline reservations." The phone does the same thing — for a quarter you get the same information....

Did you ever notice that even they're computerized?... So now you have to press buttons for an hour. ... Press 1 if you want to fly now, press 2 if you want to fly later, press 3 if you want to fly alone, press 4 if you want to fly with your sister, press 5 if it's your brother, if you're meeting your brother-in-law press 2... if you want to press a pair of pants press 90... you're pressing and pressing for an hour and a half and then you miss the plane.

Photograph by Steve J. Sherman for The New York Times

ATTENTION LIST Subscribers: When it is time to renew your membership, (look at your mailing label), please make out your check to Harvey Rait, LIST President or to Robert Malloy, Treasurer. PLEASE DO NOT MAKE OUT YOUR CHECK to LIST. Our bank requires a large amount of money in a savings account in order to cash checks. THANK YOU!

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Valley Stream, NY 11581

Robert Malloy
412 Pacific Street,
Massapequa Park, NY 11762

Due to rising postage costs outside of the United States, we must raise our annual dues accordingly:

USA postage $16.00
CANADA and MEXICO $17.50 US, and the rest of the world $24.00 US.

Bob Malloy, LIST Treasurer

WHO'S ONLINE

Some of us here at LIST have been wondering how many of our members are using modems with their Sinclair computers. It would be helpful if those of you who are into communications would take a few minutes to let us have the following info.

COMPUTER USED .....
COMMS PRGRM .....
BAUD RATE .....
EMAIL ADDRESS.....
ONLINE SERVICES USED.....
SUGGESTIONS FOR LIST.....

You can reply to me at either of the following addresses:
74776.2342@compuserve.com
bmalloy@chelsea.ios.com (Internet)

Or, you can use our snailmail address.

Bob Malloy

ON LINE

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